APPENDIX E
Economic Impact Forecast System

Economic Impact Forecast System (EIFS) Model

Socioeconomic Impact Assessment

Socioeconomic impacts are linked through cause-and-effect relationships. Military payrolls and local procurement contribute to the economic base for the region of influence (ROI). In this regard, construction of family housing at Fort Detrick will have a multiplier effect on the local and regional economy. With the proposed action, direct jobs will be created, generating new income and increasing personal spending. This spending generally creates secondary jobs, increases business volume, and increases revenues for schools and other social services.

The Economic Impact Forecast System

The U.S. Army, with the assistance of many academic and professional economists and regional scientists, developed EIFS to address the economic impacts of National Environmental Policy Act (NEPA)-requiring actions and to measure their significance. As a result of its designed applicability, and in the interest of uniformity, EIFS should be used in NEPA assessments for RCI. The entire system is designed for the scrutiny of a populace affected by the actions being studied. The algorithms in EIFS are simple and easy to understand, but still have firm, defensible bases in regional economic theory.

EIFS is implemented as an on-line system supported by the U.S. Army Environmental Policy Institute (AEPI) through the Computer Information Science Department of Clark Atlanta University, Georgia. The system is available to anyone with an approved user-id and password. University staff and the staff of AEPI are available to assist with the use of EIFS.

The databases in EIFS are national in scope and cover the approximately 3,700 counties, parishes, and independent cities that are recognized as reporting units by federal agencies. EIFS allows the user to define an economic ROI by identifying the counties, parishes, or cities to be analyzed. Once the ROI is defined, the system aggregates the data, calculates multipliers and other variables used in the various models in EIFS, and prompts the user for forecast input data.

The EIFS Model

The basis of the EIFS analytical capabilities is the calculation of multipliers that are used to estimate the impacts resulting from Army-related changes in local expenditures or employment. In calculating the multipliers, EIFS uses the economic base model approach, which relies on the ratio of total economic activity to basic economic activity. Basic, in this context, is defined as the production or employment engaged to supply goods and services outside the ROI or by federal activities (such as military installations and their employees). According to economic base theory, the ratio of total income to basic income is measurable (as the multiplier) and sufficiently stable so that future changes in economic activity can be forecast. This technique is especially appropriate for estimating aggregate impacts and makes the economic base model ideal for the EA and EIS process.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its base sector; for example, a dollar increase in local expenditures due to an expansion of its military installation. EIFS estimates its multipliers using a location quotient approach based on the concentration of industries within the region relative to the industrial concentrations for the nation.

The user inputs into the model the data elements that describe the Army action: the change in expenditures, or dollar volume of the construction project(s); the change in civilian or military employment; the average annual income of affected civilian or military employees; the percent of

civilians expected to relocate as a result of the Army's action; and the percent of military living on-post. Once these are entered into the EIFS model, a projection of changes in the local economy is provided. These are projected changes in sales volume, income, employment, and population. These four indicator variables are used to measure and evaluate socioeconomic impacts. Sales volume is the direct and indirect change in local business activity and sales (total retail and wholesale trade sales, total selected service receipts, and value-added by manufacturing). Employment is the total change in local employment due to the proposed action, including not only the direct and secondary changes in local employment, but also those personnel who are initially affected by the military action. Income is the total change in local wages and salaries due to the proposed action, which includes the sum of the direct and indirect wages and salaries, plus the income of the civilian and military personnel affected by the proposed action. Population is, of course, the increase or decrease in the local population as a result of the proposed action.

The RCI initiative at Fort Detrick would require renovation of some existing housing, demolition of some existing housing, construction of new housing, and construction of supporting facilities such as roads, walking trails, community centers, and recreational fields. The current working estimate for the cost of demolition, renovation, and construction of these facilities ($48,600,000) was divided over the projected 2-year initial development period (2004 through 2006) and entered as the change in expenditures ($24,300,000 per year).

The Significance of Socioeconomic Impacts

Once model projections are obtained, the Rational Threshold Value (RTV) profile allows the user to evaluate the significance of the impacts. This analytical tool reviews the historical trends for the defined region and develops measures of local historical fluctuations in sales volume, income, employment, and population. These evaluations identify the positive and negative changes within which a project can affect the local economy without creating a significant impact. The greatest historical changes define the boundaries that provide a basis for comparing an action's impact on the historical fluctuation in a particular area. Specifically, EIFS sets the boundaries by multiplying the maximum historical deviation of the following variables:

		Increase	Decrease
Sales Volume	X	100%	75%
Income	X	100%	67%
Employment	X	100%	67%
Population	X	100%	50%

These boundaries determine the amount of change that will affect an area. The percentage allowances are arbitrary, but sensible. The maximum positive historical fluctuation is allowed with expansion because economic growth is beneficial. While cases of damaging economic growth have been cited, and although the zero-growth concept is being accepted by many local planning groups, military base reductions and closures generally are more injurious to local economics than is expansion.

The major strengths of the RTV are its specificity to the region under analysis and its basis on actual historical data for the region. The EIFS impact model, in combination with the RTV, has proven successful in addressing perceived socioeconomic impacts. The EIFS model and the RTV technique for measuring the intensity of impacts have been reviewed by economic experts and have been deemed theoretically sound.

The following are the EIFS inputs and output data for construction and the RTV values for the ROI. These data form the basis for the socioeconomic impact analysis presented in Section 4.9.2.1.

EIFS REPORT: FORT DETRICK RCI

PROJECT NAME

Fort Detrick RCI EA

STUDY AREA

24021 Frederick County, MD

FORECAST INPUT

Change in Local Expenditures	$24,300,000
Change in Civilian Employment	0
Average Income of Affected Civilian	$0
Percent Expected to Relocate	0
Change in Military Employment	0
Average Income of Affected Military	$0
Percent of Military Living On-post	0

FORECAST OUTPUT

Employment Multiplier	2.93	
Income Multiplier	2.93	
Sales Volume – Direct	$24,300,000	
Sales Volume – Induced	$30,892,520	
Sales Volume – Total	$46,899,000	0.56%
Income – Direct	$2,715,305	
Income – Induced	$5,240,538	
Income – Total (place of work)	$7,955,843	0.16%
Employment – Direct	66	
Employment – Induced	127	
Employment – Total	192	0.21%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	17.44%	12.83%	7.76%	1.79%
Negative RTV	-7.31%	-6.18%	-4.76%	-1.36%

RTV DETAILED

SALES VOLUME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	192248	840124	0	0	0
1970	204002	842528	2405	-63472	-7.53
1971	215800	854568	12040	-53837	-6.3
1972	241557	925163	70595	4718	0.51
1973	276424	997891	72727	6850	0.69
1974	301427	979638	-18253	-84130	-8.59
1975	324469	966918	-12720	-78597	-8.13
1976	366106	1032419	65501	-376	-0.04
1977	396164	1045873	13454	-52423	-5.01
1978	443183	1090230	44357	-21520	-1.97
1979	487826	1078095	-12135	-78012	-7.24
1980	537293	1042348	-35747	-101624	-9.75
1981	576711	1015011	-27337	-93214	-9.18
1982	608033	1009335	-5677	-71554	-7.09
1983	665082	1070782	61447	-4430	-0.41
1984	756486	1164988	94206	28329	2.43
1985	854886	1273780	108792	42915	3.37
1986	956867	1397026	123246	57369	4.11
1987	1143171	1771915	374889	309012	17.44
1988	1303261	1772435	520	-65357	-3.69
1989	1402174	1808804	36369	-29508	-1.63
1990	1543230	1898173	89369	23492	1.24
1991	1571004	1853785	-44388	-110265	-5.95
1992	1727667	1969540	115756	49879	2.53
1993	1856331	2060527	90987	25110	1.22
1994	1985625	2144475	83948	18071	0.84
1995	2107564	2212942	68467	2590	0.12
1996	2233548	2278219	65277	-600	-0.03
1997	2401052	2401052	122833	56956	2.37
1998	2644430	2591541	190489	124612	4.81
1999	2890568	2774945	183404	117527	4.24
2000	3170091	2948185	173239	107362	3.64

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	311363	1360656	0	0	0
1970	332742	1374224	13568	-126827	-9.23
1971	368739	1460206	85982	-54413	-3.73
1972	418357	1602307	142101	1706	0.11
1973	481390	1737818	135511	-4884	-0.28
1974	546646	1776600	38782	-101613	-5.72
1975	612237	1824466	47867	-92528	-5.07
1976	698386	1969448	144982	4587	0.23
1977	778961	2056457	87009	-53386	-2.6
1978	897429	2207675	151218	10823	0.49
1979	1023018	2260870	53194	-87201	-3.86
1980	1180822	2290795	29925	-110470	-4.82
1981	1312335	2309710	18915	-121480	-5.26
1982	1415622	2349932	40223	-100172	-4.26
1983	1559192	2510299	160367	19972	0.8
1984	1768094	2722865	212566	72171	2.65
1985	1963364	2925412	202548	62153	2.12
1986	2163300	3158418	233006	92611	2.93
1987	2441571	3784435	626017	485622	12.83
1988	2704740	3678446	-105988	-246383	-6.7
1989	2967080	3827533	149087	8692	0.23
1990	3102518	3816097	-11436	-151831	-3.98
1991	3221026	3800811	-15287	-155682	-4.1
1992	3471442	3957444	156633	16238	0.41
1993	3704878	4112415	154971	14576	0.35
1994	3970920	4288594	176179	35784	0.83
1995	4227603	4438983	150389	9994	0.23
1996	4515465	4605774	166791	26396	0.57
1997	4978269	4978269	372495	232100	4.66
1998	5411750	5303515	325246	184851	3.49
1999	5786174	5554727	251212	110817	2
2000	6293858	5853288	298561	158166	2.7

EMPLOYMENT

Year	Value	Change	Deviation	%Deviation
1969	33396	0	0	0
1970	33438	42	-2190	-6.55
1971	33555	117	-2115	-6.3
1972	34887	1332	-900	-2.58
1973	37602	2715	483	1.28
1974	38143	541	-1691	-4.43
1975	37698	-445	-2677	-7.1
1976	39181	1483	-749	-1.91
1977	40398	1217	-1015	-2.51
1978	43018	2620	388	0.9
1979	43352	334	-1898	-4.38
1980	44176	824	-1408	-3.19
1981	44769	593	-1639	-3.66
1982	45070	301	-1931	-4.28
1983	47194	2124	-108	-0.23
1984	49620	2426	194	0.39
1985	52644	3024	792	1.5
1986	56087	3443	1211	2.16
1987	63223	7136	4904	7.76
1988	66759	3536	1304	1.95
1989	70049	3290	1058	1.51
1990	72622	2573	341	0.47
1991	72957	335	-1897	-2.6
1992	76437	3480	1248	1.63
1993	79391	2954	722	0.91
1994	83274	3883	1651	1.98
1995	86560	3286	1054	1.22
1996	90026	3466	1234	1.37
1997	93300	3274	1042	1.12
1998	96341	3041	809	0.84
1999	100795	4454	2222	2.2
2000	104818	4023	1791	1.71

POPULATION

Year	Value	Change	Deviation	%Deviation
1969	84107	0	0	0
1970	85309	1202	-2312	-2.71
1971	87210	1901	-1613	-1.85
1972	89065	1855	-1659	-1.86
1973	92094	3029	-485	-0.53
1974	93756	1662	-1852	-1.98
1975	96549	2793	-721	-0.75
1976	99822	3273	-241	-0.24
1977	103853	4031	517	0.5
1978	107719	3866	352	0.33
1979	112145	4426	912	0.81
1980	115706	3561	47	0.04
1981	119132	3426	-88	-0.07
1982	121088	1956	-1558	-1.29
1983	122627	1539	-1975	-1.61
1984	125606	2979	-535	-0.43
1985	128502	2896	-618	-0.48
1986	132124	3622	108	0.08
1987	138113	5989	2475	1.79
1988	142328	4215	701	0.49
1989	146517	4189	675	0.46
1990	151345	4828	1314	0.87
1991	155365	4020	506	0.33
1992	160140	4775	1261	0.79
1993	166136	5996	2482	1.49
1994	171801	5665	2151	1.25
1995	175923	4122	608	0.35
1996	179284	3361	-153	-0.09
1997	183285	4001	487	0.27
1998	187144	3859	345	0.18
1999	191606	4462	948	0.49
2000	196539	4933	1419	0.72

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